



**RESEARCH ARTICLE**

**Livelihood Opportunities for Tribe through Sericulture in Raigarh, Chhattisgarh, India**

**Santosh Kumar Dewangan**

Joint Collector, District- Kondagaon (C.G.), India

Email: [skdew19@rediffmail.com](mailto:skdew19@rediffmail.com)

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**ABSTRACT**

*Sericulture plays a vital role in rural development, as it integrates well with the farming systems and has the potential to generate attractive income throughout the year. It needs low capital and provides year round employment. Sericulture is an eco-friendly agro-based labor intensive and commercially attractive economic activity, falling under cottage and small-scale sector. Sericulture enterprise in its totality is a long chain industry from mulberry cultivation to fabric making. India stands second in silk production, next to China. Sericulture plays a key role in the uplift of rural population both socially and economically. Out of the 6, 38,588 villages in India, sericulture are practiced in about 69000 villages providing employment to about 8.25 million people. Sericulture is providing livelihood for 9, 47,631 families. India has the unique distinction of being the only country in the World which cultures all the known commercial varieties of silk namely mulberry, tropical tasar, oak tasar, eri and muga. India continues to be the second largest producer of silk in the World. As in 2015-16 the total raw silk production in the country is 28523 MT and goes up to 30265 MT in 2016-17 with employment generation of 85.16 lakh person. Chhattisgarh has 27 districts and all the districts have Sericulture activities. Three types of sericulture activities viz., Tasar, Mulberry & Eri are being implemented by the State. Raigarh district has total area of 2022.6 ha Daba tasar farming under with production of 15,93,7,216 lakh cocoons 63, 6375 beneficiaries. In view of the importance of sericulture enterprise, the paper tries to enlighten and discuss the significance of sericulture and strategies to be taken for the employment generation in Indian sericulture industry. Present paper explores the possible employment opportunities derived from problem analysis in the study area. The paper highlights the sericulture is a way for livelihood opportunities in Raigarh district, from the research, income level get doubled. We found positive correlation towards the economic upliftment. Change the life style of tribes due to economic growth and development. Without effecting, the traditional occupation, upliftment occurs in the field of sericulture. The study concludes with some suggestions to improve the feasibility of sericulture in long term.*

**Key words:** Sericulture, Tribal, Livelihood, Tasar, Cocoon

**INTRODUCTION**

The word “sericulture” is derived from the Greek word “sericos” meaning “silk” and “culture” meaning “rearing”. Sericulture is a labor oriented, low investment, agrarian, small scale industry which suits both marginal and small land holders because of its high returns, short gestation period and it creates opportunity for women employment. “Silk is the queen” of textiles no other fibre is a match to natural silk. Sericulture was introduced in India about 400 years back and the industry flourished as an agro- industry till 1857, with an annual production of two million pounds of silk fibre. The industry survived the onslaught of the Pebrine disease during the period from 1857 to 1895 (Mohanty, 1998). Sericulture, the art and science of growing silkworm, food plants, rearing silkworms and production of silk is basically an agro-industry. It is divided in two sectors namely farm and industry. The farm sector involves growing silkworm’s food plants, rearing silkworm to produce cocoons and producing eggs. Reeling, twisting, dyeing, printing, finishing, Knitting and felting form the industry sector (Srivastav, *et. al.* 2005). Sericulture plays a vital role in rural

development, as it integrates well with the farming systems and has the potential to generate attractive income throughout the year. It needs low capital and provides year round employment (Hanumappa and Erappa, 1985). Assures regular employment and periodic returns round the year (Lakshmannan, *et al.*, 1998). Sericulture industry as a major income generating and labor intensive industry is mainly confined to the state of Andhra Pradesh, Karnataka, Tamil Nadu and West Bengal, with a very little production in Jammu and Kashmir, Uttar Pradesh and some pockets of Rajasthan (Dhane and Dhane, 2004). Sericulture is an eco-friendly agro-based labor intensive and commercially attractive economic activity, falling under cottage and small-scale sector. Sericulture enterprise in its totality is a long chain industry from mulberry cultivation to fabric making. India stands second in silk production, next to China. Total raw silk production in India was 26.5 MT, out of which mulberry raw silk production was 19.5 MT (73.55%) during 2013-2014 (Annual report, CSB, 2013-2014).

Sericulture plays a key role in the uplift of rural population both socially and economically (Sreenivasa and Hiriyanna, 2014), Best suited to both marginal and small scale landholders because of its low investment, high assured returns, short gestation period, rich opportunities for enhancement of income and creation of family employment throughout the year (Raveendran, *et al.*, 1993; Srinivasa, *et al.*, 1998, 2014; Hajare, *et al.*, 2005). India is the only Country in the world to produce all the four known varieties of silk including Mulberry, Eri, Tasar and Muga. Sericulture in India is a fairly organized activity that is in the cottage industry segment and is largely rural based and labor intensive. Cultivation is spread Over 22 states, Covering 172000 hectares across 54000 villages operating 258000 handlooms and 29340 power looms. (Dewangan, *et al.*, 2011). India has the unique distinction of being the only country in the World which cultures all the known commercial varieties of silk namely mulberry, tropical tasar, oak tasar, eri and muga. The total annual production of raw silk in India was 19,690 MT, accounting for 15.44 per cent of the World raw silk production, of which, mulberry raw silk output aggregated to about 16,322 MT during 2009-10. The remaining 3,368 MT was from non-mulberry silks (Qadri, *et al.*, 2011). Chhattisgarh has 27 districts and all the districts have Sericulture activities. Three types of sericulture activities viz., Tasar, Mulberry & Eri (recently introduced) are being implemented by the State. Tasar rearing and cloth manufacturing is being practiced as cottage industry on traditional basis. Sericulture provides gainful employment to the socially and economically weaker section of the society, living below the poverty line, especially the women folk of rural areas (Yadaw, 2014). Raigarh district stand first in area under plantation of host plant for silkworm rearing. Raigarh district has total area of 2022.6 ha Daba tasar farming under with production of 15,93,7,216 lakh cocoons 63, 6375 beneficiaries (Anonymous, 2012a). During the year 1990-91 the area under mulberry was 3, 13,109 hac. About 60, 00,000 people employed in sericulture activities in our country. (Datta, 1991). During 1977-78 the persons employed in sericulture were only 38.06 lakh, in a decade their number rose to 60.30 lakh people. (Hanumappa, 1993). Sericulture is the only cash crop, which provides frequent and attractive returns in the tropical states of the country through year. The average annual income per hectare was around Rs. 40,000 (Jagannath, 1995). In Sundergarh district [Orissa], On an average a rearers family rear 350 dfls, annually and earns 19% of their total annual income of Rs. 44500/- (Brahmachari, 2004). Socio-economic condition of the tasar rearers / reelers/ weavers in Korba district (Chhattisgarh), Were majority of the rearers (44%) fall in the income group of Rs. 5000-10000 from tasar silkworm rearing, which formed about 19% of the total income Rs. 47631.58 (Brahmachari, *et al.* 2006). Sericulture has been found to be one of the important economics enterprises. An average net income of Rs. 67296 /hac./year through sericulture (Dandin, *et al.* 2008). In Surguja, the tribal women engaged in this activity were living below the poverty line (BPL), having an annual family income of Rs. 11,850.00 or less (Bhatia, *et al.* 2009). Reddy (2006) found that the majority of the sericulturists (77.50%) grouped under medium annual income level ranged between Rs. 49843 to 129327 followed by high (15.00%) and low (7.50%). Pandit, *et al.* (2008) revealed that more than 67.63 per cent farmers earn their livelihood

mainly from cultivation more especially from sericulture. Balakrishanappa and Rajan (2010) have observed that sericulture is one of the prominent enterprises, which provided full time employment to the entire family, offering high income and better standard of living. It was observed that the middle age farmers used improved technologies than the old age people. Due to the adoption of new technology the production of cocoon also increased, which increased the income and standard of living. Ali (2010) revealed that 26.66 per cent respondents had annual income between 50,000/- to 1, 00,000/- followed by 1, 00,000/- to 1, 50,000/- of 20 per cent respondents, respectively. While, there is similar type of annual income from other group. According to Prabhakaran (2011) Tamil Nadu occupies third position in the country in silk production. During 2009-10, 22,633 farmers are practicing sericulture in Tamil Nadu, cultivating mulberry in 14,220 hectares generating employment opportunities to 1,77,750 persons. There is tremendous growth in sericulture activities in Tamil Nadu in the past few years, with cocoon production of 8,587 MT, raw silk production of 1,233 MT, DFLs production of 131.250 lakh numbers. According to Tagat (2011), in Karnataka, the area under mulberry was 78,000, 87,734, 97,647, 91,434 and 77,329 hectares; cocoon production was 54,210, 55,493, 58,697, 60,796 and 53,377 MT and raw silk production was 7,302, 7,471, 7,883, 8,239 and 7,238 MT during the period 2004-05, 2005-06, 2006-07, 2007-08 and 2008-09, respectively. Dewangan et al. (2012) revealed that the total monthly income obtained from all sources to the families involved in sericulture occupation is average 3840/-. The total monthly expenditure is about 2380/-. The respondent tribe of study area collects forest minor products and thus they earn income about 5950/- 29 once in year which is a satisfactory amount for poor families. Todmal, *et al.* (2013) observed that majority of the respondents (53.75%) had medium experience in sericulture of 5 to 6 lots, followed by 43.75 per cent had low experience (3 to 4 lots) and 2.50 per cent had high experience (7 and above lots). Mote and Sananse (2014) conducted trend analysis of global area, production, growth rates of global export and import scenario of raw silk, employing compound growth rate and other statistical techniques. The growth rate analysis indicated that during 1997-98 to 2011-12, the rate of growth in total silk production of China and India was increasing at a significant rate of 6.90% and 2.60%, respectively. Various workers have studied on socio-economic of sericulture viz. Giri 1970, Balasubramanyam 1986, Paul 1987, Thangavelu 1995, Goel 1993, Benchamin 2000, Mohanty 1998, Saluja 2002. Ravindran, *et al.*, 1993. Lakshmanan, *et al.*, 1996. All research work done by scientist as mentioned above are outside the Chhattisgarh, so we tried for this type of work and selected Raigarh district, Block Tamnar.

#### **MATERIAL AND METHODOLOGY**

The present investigation was carried out in Tamnar Block of Raigarh district, Chhattisgarh state, was purposely selected for the study, and based on potentiality and production of tasar/mulberry cocoons, where both types of sericulture- mulberry and tasar are being practiced. The study area has about 364 acres under mulberry cultivation though effective area is only 80-120 acres. Mulberry gardens are 18 in number. Mulberry Reeling Unit in 1 number. Tasar culture is a traditional and exclusive craft of the tribal of study area and is being practice from 13 years. Total area covered under tasar centers is about 3153.25 acres though effective area is about 2350 acre. Tasar centers are 22 in number. Tasar plantation under CGSP is situated in 57 sites and covers 3795 acres. Tasar rearings in forest are covered 4729.88 acres. The total beneficiaries are 5739 out of them 3347 are tribal in the district. Initially the list of sericultural villages and the names of beneficiaries were obtained from local sericultural department of Tamnar Block, The primary data was collected from the sampled respondents following the personal interview method using structured interview schedule standardized by Nagaraja (1989). In the above study area four villages were selected and in each village 25 beneficiaries were selected at random for collection of data. Thus 100 beneficiaries were selected from block. The farmers were post classified into main and additional based on the engagement of employment. The information sought from the

respondents involved in sericulture activities consisted of three types. The first type pertained to general information. The second type information was related to Occupational Status, Employment days in a year, Total Monthly Income, Total Expenditure, Occupation before the Sericulture, Duration of Sericulture Work, Main Occupation related to Sericulture, Average Annual Income from the Old Occupation, Crops take in a year, Cocoon produced in each crop, Profit from each crop, Yearly production of cocoons, Average Annual Income. The third type of information pertained to the Losses in Sericulture, Compensation by Government, Loan according to requirement, Attachment with Sericulture, Sericulture is favorable or not, Traditional Business is affected or not, Total labor period, Change in economic status, Change in Annual Income through Sericulture, Displacement by Sericulture, Impact of Sericulture in Life Style and economics of silk production. Primary and secondary data was analyzed using various statistical tools viz., mean, mode and median.

## RESULT AND DISCUSSION

### TYPE OF HOUSE:

On the basis of study, the analysis pertaining to employment, income, occupation, risks factor and social impact in Tamnar block first type of information related that the Kachha houses are 99. On the other hand Pakka house are 1. Regarding ownership of house in study area, it covered 94 respondents.

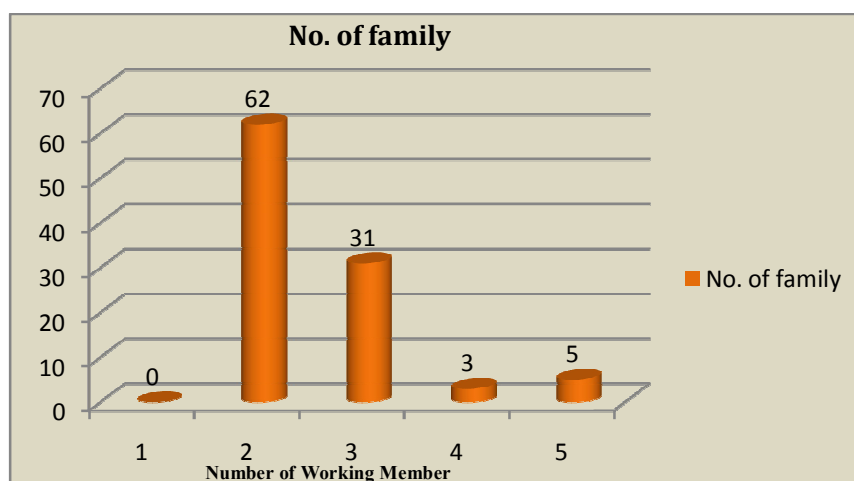
### STATUS OF WORKING MEMBER IN FAMILY:

It is observed that in Tamnar block the number of working members in 62 families 2, in 31 families 3, in 3 families 4 and in 4 families 5 members are working. It is clear through the analysis that 3 members are involved in the occupation from the average families. It means there is a positive attitude of the members from each family. Sericulture was adopted as Secondary occupation by 98% beneficiaries rest respondents adopted it as primary occupation.

$$\begin{aligned} M &= (1/N) \sum fx, \\ &= (1/100) 249, \\ &= 2.49 \end{aligned}$$

Where, N = Number of observation  
F = Frequency (collected data)  
x = Variable (as per situation)

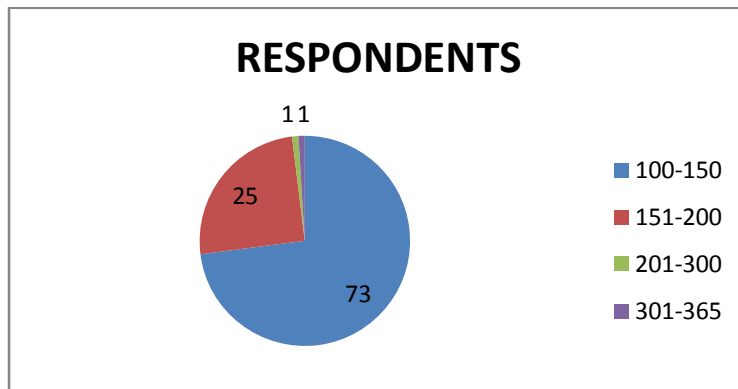
**Graph 1:** Status of Working Member in Family



**EMPLOYMENT DAYS FROM SERICULTURE:**

In Tamnar block 73% respondents received employment for 100-150 days and 25% received 151-200 days. 201-300 days' employment received by 1% and 301-365 days employment receiver's respondents are 1%. 89 respondent says that the employment site is situated their own village where they got employment from sericulture activity.

**Graph 2:** Status of Employment Days Earn From Sericulture



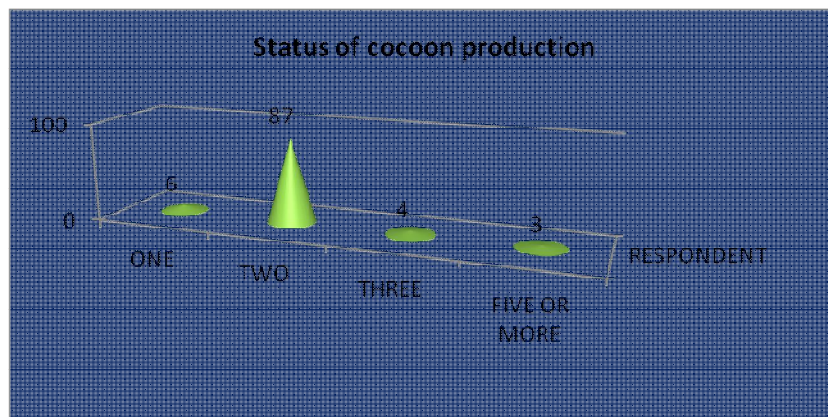
**INCOME FROM SERICULTURE:**

The data indicate that total average monthly income in Tamnar is only Rs. 3540/- at their village itself. Whereas from the forest minor produce collection and disposal (once in a year) the average income of the respondents has been estimated Rs. 6550/- The economic status in old occupation is normal for 88 and bad for 11 and very poor for 01 respondent. The total monthly expenditure of the family from all sources are Rs.2410/-. Only 06 respondents are indebtness. The average annual income from the old occupation was Rs. 21400/-.

**COCOON PRODUCTION AND PROFIT:**

It is observed in the study area that 06 respondents take only one crop in a year while 87 take two crops in a year. In Same manner 04 respondents take 3 crops in a year. Only 03 respondents take five crops in a year. The numbers of cocoon produced are 7750/crop/beneficiaries. The economic gain by the respondent is Rs.5760/-. The yearly production of cocoons by the respondent is 19800 numbers. Average annual income about Rs 18000/-.

**Graph 3:** Status of Cocoon Production in Study Area



**SERICULTURE AND RISK FACTOR:**

98 respondents had been bore a loss from Sericulture and 02 had not suffered. It indicates the hardship and risk involved in it. Almost all attributed the loss to fluctuation of atmospheric and adverse weather conditions viz heavy rains; high humidity and high temperature, pollution cause disease which leads to a complete failure of their crops. Out of 100 respondents only 5 get compensation from government where as 95 denied. All respondents are accorded full cooperation by the officers of sericulture department. Only 35 respondent get loan as per their requirement and 65 not get. This occupation is not new to the tribes in the study area because they are practicing sericulture since average of 9.8 year. DFLs were supplied from Sericulture centers and their demand of dfls was easily fulfilled by the State sericulture department.

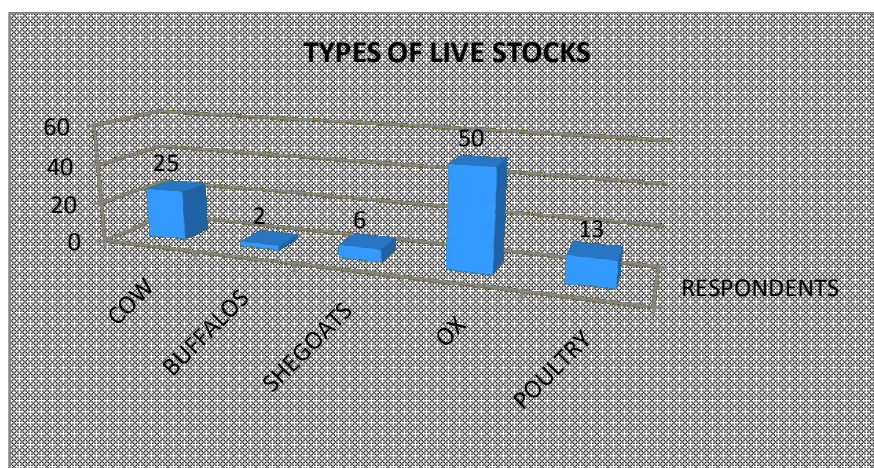
**SERICULTURE AND SOCIAL IMPACT:**

It is observed that all the respondents attributed the following impact by Sericulture –Conservation of environment, No cutting and felling of trees, Interstate migration is checked, Local employment is generated. It served as additional income generating source, Regular savings habit has been developed, want to attach continue with the sericulture. It is suited to their lifestyle. The work is simple and can be done without any cost. Can serve better for the additional income generation and pave the way for the local employment generation. The total labour period has been estimated In Tamnar 8.09 hrs. 97 respondents agreed that their economic status has changed. It has been estimated that the annual income rose up to an average of Rs 23650/- respondent of study area. The present findings confirm the earlier reports of Kumar, 2009; Malathesh *et. al.* 2009; Shendage *et. al.* 2009; Singh *et. al.* 2009; Thakur and Sharma 2009; Mitra and Verick 2013.

**TYPES OF LIVESTOCK (MILCHING):**

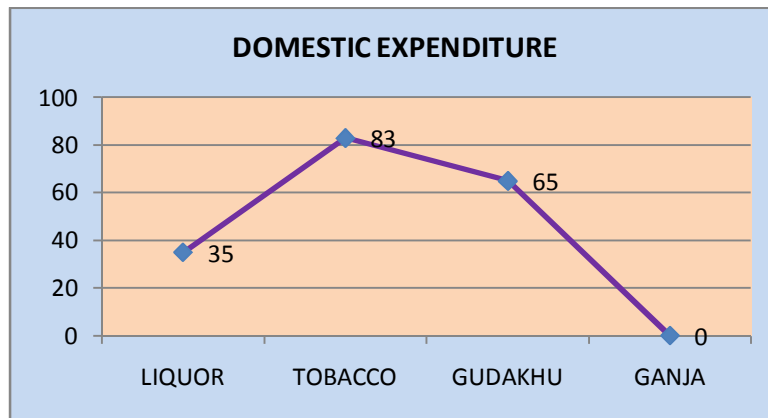
In the study area 25 respondents have cow, 02 respondents have buffalos. 06 respondents have shegoats. As a live stock engaged in household burden, Ox- by 50 respondents and 13 respondents have poultry.

**Graph 4:** Status of Livestocks in Study Area

**DOMESTIC EXPENDITURE:**

In the category of Liquor and Narcotics, 35 respondents consume there expenditure in liquor. On Tobacco maximum expenditure is incurred by the respondents i.e. 83, same as on Gudakhu 65 respondents domestic expenditure has been incurred. In study area no respondents incurred expenditure on Gaanja.

**Graph 5:** Status of Domestic Expenditure in Study Area



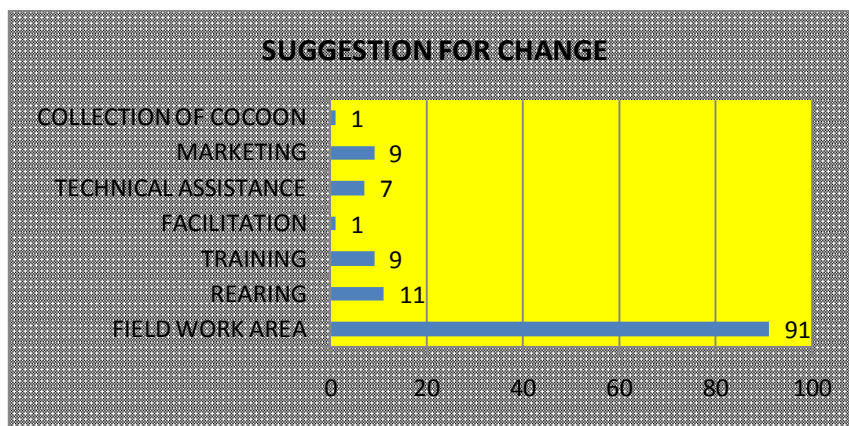
**DISPLACEMENT FOR SERICULTURE AS LIVELIHOOD:**

It is observed that displaced or migrated for livelihood, there is no respondents displaced from study area. 01 respondent feel that sericulture has affected their traditional business/occupation.

**SUGGESTION FOR CHANGE:**

It is observed in the study area that 91 respondents suggest for change in field work area. 11 respondents suggest for change in rearing. 09 respondents suggest for change in training. 01 respondent suggest for change in facilitation. Suggestion for change is also observed for Technical Assistance 07 respondents, for collection of cocoon 01 respondent and for Marketing 09 respondents. It is observed in the study area that 85 respondents replied about the consultation with them before enforcing sericulture, whereas 15 opined that not consulting with them. So that 22 respondents learn sericulture from training and rest from learn to seeing others workers.

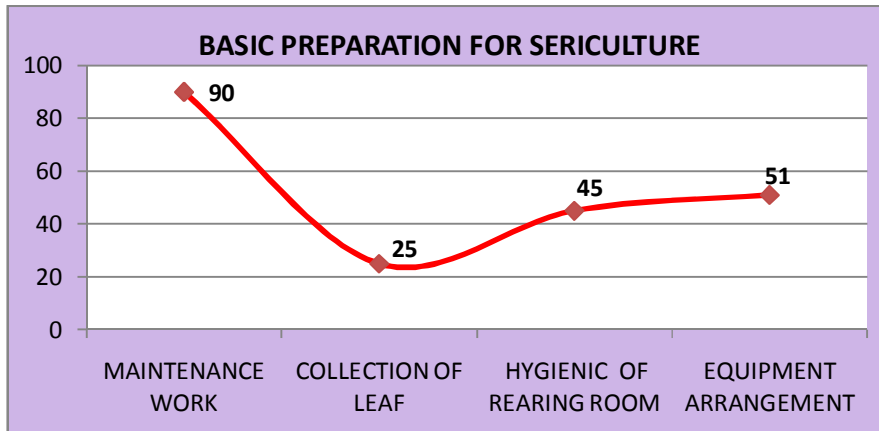
**Graph 6:** Status of Suggestion for Change in Study Area



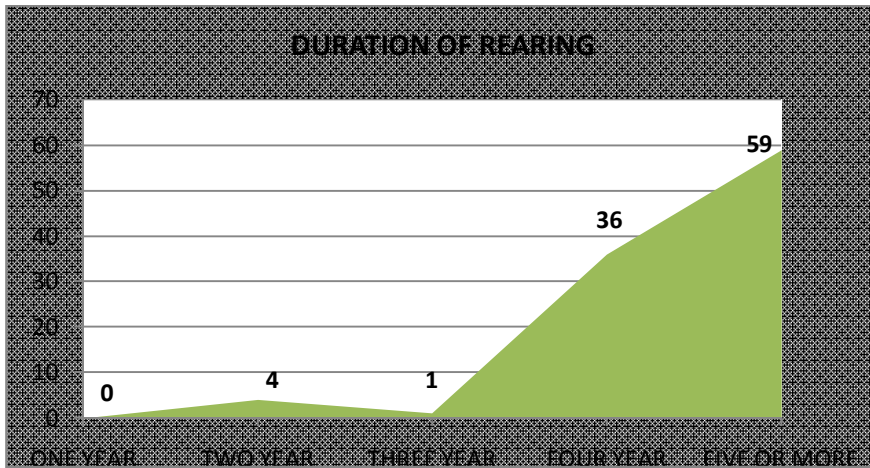
**BASIC PREPARATION FOR SERICULTURE:**

It is observed in the study area that 90 respondents emphasized that they preferably do the Maintenance work on priority basis followed by collection of leaf by 25 Respondents, Maintenance of hygienic conditions of rearing room by 45 respondents, So as concerned with arrangement of equipment 51 respondents, prefer the work for basic preparation.

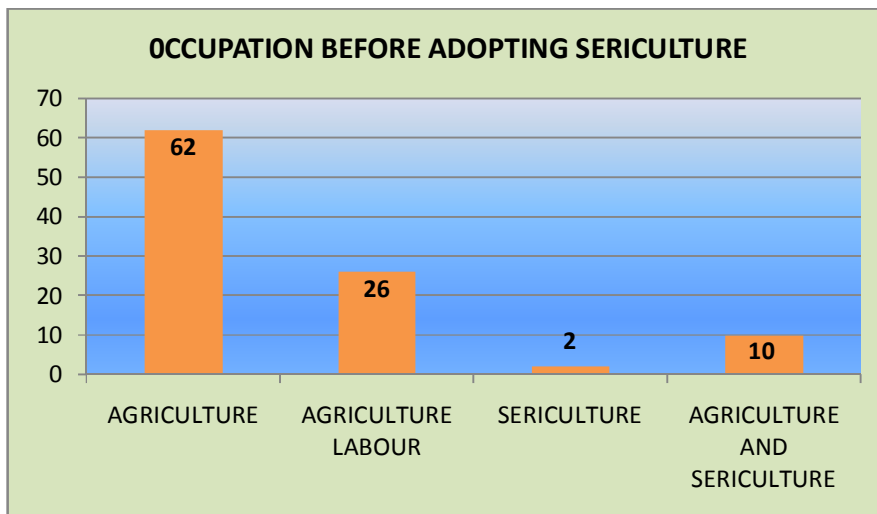
**Graph 7:** Status of Basic Preparation for Sericulture in Study Area



**Graph 8:** Status of Duration of Rearing of Silkworm



**Graph 8:** Status of Occupation before Adopting Sericulture in Study Area





**DURATION OF REARING OF SILKWORM:**

In the study area parameter namely as how long respondents are being working with rearing of silkworm, it comes under observation that 04 respondents duration of rearing is only two years whereas 01 respondent do that since three years. Again for four years work as silkworm rearing 36 respondents covered. For 5 or more than five years it's counted as 59 respondents from block.

**OCCUPATION BEFORE ADOPTING SERICULTURE:**

Out of 100 respondents from study area, the main occupation before adoption of sericulture was Agriculture for 62, whereas 26 respondents do as agriculture labor. Only 02 respondents are busy with sericulture, in agriculture with sericulture work are done by 10 respondents from Tamnar block. Primary host plant for silkworm rearing is in the priority of *T. arjuna*, *T. tomentosa*, *M. alba* & *S. robusta* with *Z. zuzuba* and that is about 3300 for each respondent. All respondents are accepted that the work of sericulture is comparatively better than other work.

**Photo 1:** Spraying powder for disease prevention    **Photo 2:** Spraying Insecticide for prevention



**Photo 3:** Respondents with rearing equipments



**Photo 4:** Emerging silk moth from cocoon**CONCLUSION**

Sericulture has emerged as the most important cash crop with minimum investment, low gestation period, high employment potential and highly remunerative return. It is well suited to the agrarian economy of the Tribal. Suitable for every section of society, a big farmer or a landless farmer, aged person or a youth, man or a woman. Insures optimum utilization of resources–human and other Inputs-locally involves simple technology, which is easy to understand and adopt- Transfers urban wealth to rural producers effectively. Sericulture has provide downstream employment and income generation in rural and semi-urban areas, high participation for low-income and socially under privileged groups, a larger role for women in development and huge potential for contribution to export earnings. The opportunity lies with this sericulture sector is in its income effect associated with the large section of downtrodden artisans who could in turn generate a large spillover effect over the society as a whole. Poverty and income inequality can be harnessed if expansion of sericulture can be sustained in the rural sector. It has been observed that in sericulture 57% of its final value is flown back to the primary producers. This Sericulture sector is not only important for generating rural employment and preventing rural migration but also for protection and preservation of ecology, socio-economic change, heritage and socio-cultural values. Tasar culture is practiced on the forest plants in wild condition. The advantage of tasar culture is that it does not require any investment of plantation, rearing appliances, electricity and other essentials like mulberry sericulture. Sericulture provides more than 50% employment to the respondent in a year thus stops the inter-state migration. According to the MNREGA (Mahatma Gandhi National Rural Employment Guaranty Programme) population must receive 100 days employment in a year where as sericulture provides 151-200 days employment to respondent i.e., 64%. It is noteworthy that adopting the Sericulture by tribal they conserve the environment by non-cutting and felling of trees because sericulture is now their way of life. Interstate migration is checked because sericulture provides additional income at their door level. Regular savings habit has been developed by sericulture practices among the tribes because they earn much more than their standard of living. It is remarkable that sericulture is suited the life style of tribe because practice of sericulture is simple and can be done without any cost and skill. Sericulture activities provide a perfect choice for the women because of the very nature of the activities that can take place close to the habitation. Gapes in technology transfer and extension support, inadequate market accessibility, poor linkage among

different stake holders, are observed as weakness of sericulture in study area. It is found in study that wild Tasar biodiversity is facing unparallel threat of extinction from their natural habitat due to environmental degradation and other related issues like deforestation, unsustainable fuel wood extraction, unplanned agricultural practices, encroachment into forest land for agriculture and forest settlements, forest fire, over grazing, non adoption of adequate soil conservation measures.

### SUGGESTION

1. The government should give them compensations for the losses incurred in this occupation due to diseases and the negative impact of natural factors.
2. There should be enough loan facilities for the improvement of their occupation which is still more beneficial.
3. The government should be encouraging them to make clothes along with sericulture occupation.
4. Public Private Participation in the Post-cocoon sector and contract farming with NGOs and corporate participation.
5. Decrease in forest/timber cutting and diversion towards farm/nonfarm activities, saving of forest land from massive soil erosion through contour Bunding.
6. Covering of degraded lands with plantation of Tasar food plants are basic solution for biodiversity conservation.
7. Diversity of Sericigenous moths needs to be conserved through well planned and sustainable measures. Conservation of forest bio-diversity requires community involvement, especially tribal's.

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